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(54) **Frame structure for supporting the control and indicator members in machines for treating laundry**

(57) A frame structure which can be fixed along the top side of the front wall of domestic laundry washing and drying machines to provide support for the control and indicator members of the machine and the associated front cover panels comprises a perimetral frame member 9 of substantially rectangular shape, and at least one transverse member 11 provided with openings 25 for supporting the control and indicator members of the machine and capable of being removably fixed in a plurality of support positions between the bottom side and the top side of said frame member; the bottom side and the top side of said frame member being provided with a plurality of lower 14 and upper 15 fixing seats which are capable of removably retaining corresponding engagement means (18, 19, 22, Fig 3) at the lower end and the upper end of said transverse member. The frame structure can thus be adapted to suit the needs of a number of models in the same range of machine which have different requirements as to number and position of control and indicator members.

Fig.2.

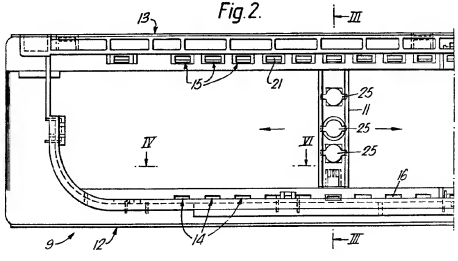

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Fig.1.

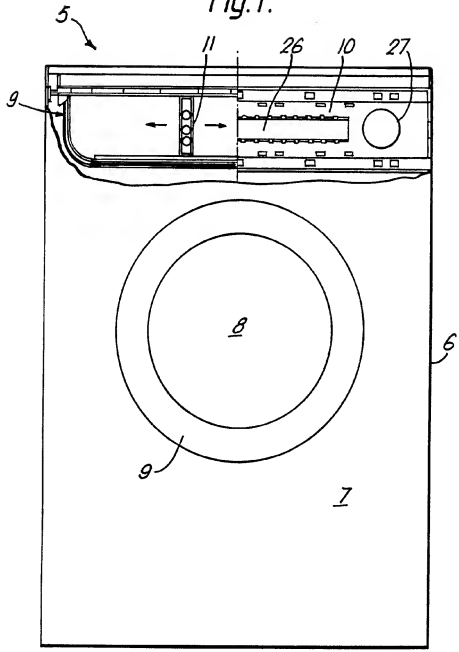


Fig. 2.

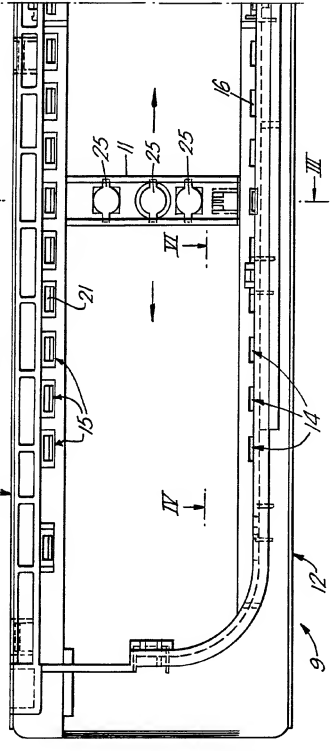


Fig. 4.

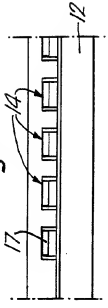
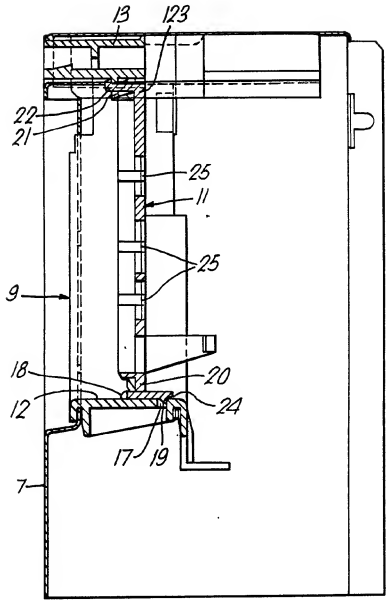


Fig.3.



FRAME STRUCTURE FOR SUPPORTING THE CONTROL AND INDICATOR MEMBERS IN MACHINES FOR TREATING LAUNDRY

The present invention concerns a frame structure for supporting the control and indicator members in machines for treating laundry, in particular in washing machines, laundry drying machines and the like of domestic type.

It is known that such machines generally have on their front a control panel which comprises actuating members such as knobs, pushbuttons etc and indicator members such as light tell-tales and luminous dials for controlling the operation of the machine.

Such a control panel is usually formed by a rear plate which is suitably apertured for supporting the control and indicator members in predetermined positions, and a front cover which besides having a decorative function also carries the symbols and indications of use of the machine.

It is also known that the range of a given type of machine (for example a laundry drying machine) comprises models which are referred to as the 'base' models, which are capable of performing only the principal functions of the drying program, and more sophisticated models which are capable of performing additional functions and permitting the user to set the variables of the drying program, at the user's discretion. It will be apparent that the variety of models of machine also requires a diversity of control panels which, while still being of the same general dimensions, must be of different compositions in terms of the actuating and indicator members for the purposes of permitting the insertion of additional control components.

In order to satisfy that requirement, different types of support plates and associated front covers for each alternative form of the same type of machine had to be prepared and stored in advance.

The considerable stock and diversity of parts

required causes undesirable complications in managing warehousing operations and assembly of the machines and also involves the risk that a good part of such components remain unused in a situation where the model of machine for which they are intended undergoes modifications or involves a lower market demand than that envisaged.

Solutions are also known which make it possible in a flexible manner to provide different types of control panels for the same type of domestic electrical appliance. For example, European patent application number 0077928 discloses a fixing device for the controls of domestic cookers, which involves a base plate which can be adapted to a plurality of types of domestic electrical appliance and which is provided with recesses for permitting the positioning of housings for receiving the mechanical parts of the controls of the domestic appliance. Similarly, Austrian patent number 177850 proposes a base plate provided with holes which are intended to permit the control members to be fixed thereto and the associated regulating shafts and spindles to pass therethrough.

The described solutions however suffer from the disadvantage of requiring a base plate which, even if provided with openings and holes for a plurality of alternative positions in respect of the control and indictor members, does not afford a sufficient degree of flexibility in terms of the composition of the control panel.

In actual fact the support plate may involve only a limited number of perforations and it does not guarantee the option of interchanging the position of components which require perforations or openings which are different from each other. It would therefore be desirable, and that is the main aim of the invention, to provide a support frame structure for the control and indicator members which, in a simple and rational manner, affords improved flexibility in regard to positioning of such members and which makes it

possible to rationalise management of warehousing and the assembly of all the alternative forms of the same type of machine. According to the present invention, there is provided a frame structure for supporting the control and indicator members of a machine for treating laundry comprising a perimetral frame member of substantially rectangular shape, and at least one transverse member provided with openings for supporting the control and indicator members of the machine and being capable of being removably fixed between the bottom side and the top side of said frame member in any one of a plurality of support positions along the frame member; the bottom side and the top side of said frame member being provided with a plurality of lower and upper fixing seats which are capable of removably retaining corresponding engagement means at the lower end and the upper end of said transverse member.

The invention will be further described purely by way of non-limiting example with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a partly sectional front view of a laundry drying machine provided with the support frame structure for the control and signalling members in accordance with the invention;

Figure 2 is a view on an enlarged scale of part of the front side of the frame structure;

Figure 3 is a view in longitudinal section taken along line III-III in figure 2; and

Figure 4 shows a view in cross-section taken along line IV-IV in figure 2.

The laundry drying machine 5 shown in the drawings is of the type having a drum which is rotatable about a horizontal axis and comprises an external casing 6 of parallelepipedic shape, in the front wall 7 of which is provided the opening 8 for loading the laundry and the associated closure door 9. The laundry drying machine 5 is

provided in known manner with all the mechanical and electrical devices required for operation thereof, which are sufficiently known that they can be disregarded for the purposes of the present description. In general terms the machine performs a drying operation by passing heated air through the rotatable laundry drum.

The moist air issuing from the drum is discharged into the area around the drum if the machine is of an open drying circuit type or is passed to a dehumidification device and recirculated to the laundry drum if the machine is of the closed drying circuit type.

Fixed along the top side of the front wall 7 of the machine 5 by means of screw systems (not shown) is a frame structure 9 for supporting the control and indicator members of the machine 5 (for example timers, selectors, pushbuttons, light tell-tales etc) which are also of known type and are therefore not shown herein.

Associated with the frame structure 9 by means of snap-engagement or latch systems (not shown) is a front baffle 10 which performs the function of a cover for the open spaces of the frame structure 9 and a support for the cover members which are used from time to time to complete the control panels of the various types of laundry drying machine. The frame structure 9 comprises a frame member of substantially rectangular shape and one or more transverse support members 11 which are capable of being removably fixed to the frame structure 9.

In particular disposed along the lower and upper edges 12 and 13 respectively of the frame structure 9 (see figure 2), at modular spacings from each other, are a plurality of seats, being lower seats 14 (see figures 2 and 4) and upper seats 15 (see figures 2 and 3), capable of co-operating with each other for snap-engagement fitting of the ends of the transverse support members 11.

Each lower seat 14 has a horizontal slot 16 (see

figure 2) and a vertical hole 17 (see figure 4) which are respectively capable of engaging a horizontal projection 18 (see figure 3) and a vertical projection 19 at the lower end 20 of the transverse support member 11. Each upper seat 15 in the top side 13 of the frame structure 9 is provided with an inclined opening 21 (see figure 3) which is capable of snap engagement with a hook-shaped projection 22 on the upper end 23 of the transverse support member 11.

The operation of mounting the transverse support member 11 to the frame structure 9 involves positioning the projections 18 and 19 at the lower end 20 of the transverse member 11 within the slots 16 and 17 at the lower side 12 of the frame structure 9. Thereupon the hook-shaped projection 22 at the upper end 23 of the transverse member 11 is pressed into the inclined opening 21 at the top side 13 of the frame structure 9 until it comes into snap engagement with the outside edge of the inclined opening 21. The transverse member 11 can be disengaged by simply inserting a tool with a flat point (for example a screwdriver or the like) into a receiving hollow 24 disposed beneath the lower end 20 of the transverse member 11.

By applying an upward pressure to the hollow 24, the vertical projection 19 is resiliently disengaged from the respective hole 17 and it is thus possible to incline the transverse member 11 through a sufficient angle to disengage the hook-shaped projection 22 at the upper end 23 of the transverse member 11 from the inclined opening 21 in the frame structure 9. The transverse member 11 shown in the drawings is provided along its vertical axis with slots 25 suitable to permit the fixing thereto of the control and indicator members of the control panel of the machine 5.

It will be clear that, for some components to be fitted in the frame structure 9, it is possible to use transverse members 11 of a single type while for other components it is necessary to use transverse members 11 of

different shapes which are possibly capable of also engaging more than one upper and lower seat 15 and 14 respectively.

However the disadvantages which derive from possible distinctions between the types of transverse member 11 are negligible in comparison with the notable advantages which derive from a frame structure 9 which can be unified for any model of machine in the range.

As already emphasized in the opening part of the present description, a front panel 10 is then fitted by a snap-engagement action to the frame structure 9, the front panel 10 being provided with a slot 26 which extends horizontally over virtually the entire panel 10 for the purposes of permitting the control and indicator members to be made up in a plurality of different ways. The panel 10 may possibly be provided with one or more openings for the fixing of components which are intended to be in a fixed position in all the types of control panels in the range (for example a timer).

The procedure then involves, in known manner, fixing to the front panel 10 the cover members which are shaped from time to time to cover the zones which are not required by the control and indicator members and which are provided with symbols and indications relating to the mode of operation of the machine. It will be apparent from the foregoing description that one or more transverse support members 11 may be fixed in multiple positions within the frame structure 9 in order to be able to provide other options in regard to positioning of the control and indicator members which the support member or members is or are to support.

It will be appreciated that the frame structure according to the invention may be the subject of various modifications and alternatives subject however to the main features claimed hereinafter.

CLAIMS

1. A frame structure for supporting the control and indicator members of a machine for treating laundry comprising a perimetral frame member of substantially rectangular shape, and at least one transverse member provided with openings for supporting the control and indicator members of the machine and being capable of being removably fixed between the bottom side and the top side of said frame member in any one of a plurality of support positions along the frame member; the bottom side and the top side of said frame member being provided with a plurality of lower and upper fixing seats which are capable of removably retaining corresponding engagement means at the lower end and the upper end of said transverse member.

2. A frame structure according to claim 1 wherein the lower end and the upper end of the transverse member are provided with a plurality of engagement means capable of being simultaneously fixed in a plurality of lower and upper fixing seats in the frame member.

3. A frame structure according to claims 1 and 2 wherein the fixing seats at the bottom side of the frame member are formed by a horizontal slot and a vertical hole which are respectively capable of engaging a horizontal projection and a vertical projection at the lower end of the transverse member and that the fixing seats in the top side of the frame member are formed by an inclined opening capable of snap engagement with a hook-shaped projection at the upper end of the transverse member.

4. A frame structure according to claim 1, 2 or 3 wherein the lower end of the transverse member is provided with a recess which, by means of the insertion of a tool is

capable of permitting resilient disengagement of the lower end of the transverse member from the corresponding fixing seat in the frame member and, by inclination of the transverse member, is capable of permitting subsequent disengagement of the hook-shaped projection at the upper end of the transverse member from the inclined opening in the top side of the frame member.

5. A frame structure constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

6. A laundry treatment machine having an outer casing to the upper front wall of which is affixed a frame structure according to any one of the preceding claims, the frame structure supporting control and/or indicator members of the machine and/or one or more cover panels.

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